REMARKS

At the time of the Office Action dated April 21, 2005, claims 1-62 were pending. Of those claims, claims 1-22, 24-31, 33-39 and 41-62 have been withdrawn from consideration pursuant to the provisions of 37 C.F.R. §1.142(b). Claims 23, 32 and 40 stand rejected.

In this Amendment, claims 23, 32 and 40 have been amended, claims 1-22, 24-31, 33-39 and 41-62 canceled, and new claims 63-67 added. Care has been exercised to avoid the introduction of new matter. Claims 23, 32 and 40 have been amended to improve wording. Adequate descriptive support for the new claims can be found on, for example, page 37, line 8 through page 42, line 26 of the specification ("Embodiment 11"). New dependent claim 64 recites a neural network, especially a radial basis function network (RBF network), which is described as an example of a nonlinear model in Embodiment 11. New claim 65 recites approximate coefficient deriving means for obtaining an weighed coefficient for the RBF network.

Claims 23, 32 and 40 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Wober et al. in view of Takeuchi.

In the statement of the rejection, the Examiner admitted that while Wober et al. teaches using interpolation to enlarge an image, the reference does not explicitly teach nonlinear interpolation. However, the Examiner applied Takeuchi, and asserted that using nonlinear interpolation is well known in the art. The Examiner then concluded that it would have been obvious to modify Wober's device based on the teachings of Takeuchi. This rejection is respectfully traversed.

Wober et al. teaches a method of enlarging an image by scaling it in a frequency domain. According to Fig. 3 of Wober et al., when an image is enlarged, one dimensional DCT transform is performed twice on the image in different directions, whereby a two dimensional DCT transform is executed. After a DCT coefficient matrix is obtained in such a way, the image is enlarged by performing a two dimensional IDCT transform using a non square matrix corresponding to an enlargement ratio and a transpose matrix thereof. For instance, an 8 x 8 coefficient matrix is multiplied by a 10 x 8 basis matrix, whereby an intermediate matrix is obtained. The intermediate matrix is multiplied by an 8 x 10 transpose matrix, and 10 x 10 data in the spatial domain can be obtained.

Takeuchi teaches mitigating deterioration due to reduction and enlargement of images. When a thickened or dropped line are detected, an weighted-average between the thickened or dropped line and an adjacent line is calculated in order to modify the mitigation. Takeuchi discloses the term "nonlinear interpolation" as interpolation other than weighted-average processing.

However, neither Wober et al. nor Takeuchi discloses a process for calculating frequency components of an enlarged image in accordance with frequency components of the original image. Wober et al. performs enlargement of an image in the process of the inverse DCT transformation. The enlarged image is obtained in the spatial domain. However, frequency components of the enlarged image are not obtained therein.

As recited in claims 23, 32 and 40 frequency components of an enlarged image are calculated, and then the enlarged image is obtained by performing the inverse orthogonal transform on the obtained frequency components. These recitations are not taught or suggested by the applied combination of Wober et al. and Takeuchi.

In addition, new claims 63, 66 and 67 recite "estimating a nonlinear relation between frequency components of said enlarged image and component positions based on the frequency components of said enlarged image to obtain the frequency components of said enlarged image." The applied combination of the references does not teach the above recitation, either. The recitation makes it clear that interpolation is not performed in the process of the inverse orthogonal transform.

Thus, consideration of the teachings of Wober et al. and Takeuchi, either individually or in combination, would not have taught or suggested each and every limitation of claims 23, 32 and 40, as well as new claims 63, 66 and 67. It is also noted that new dependent claims 64 and 65, depending on claim 63, are patentably distinguishable at least because they include all the limitations recited in claim 63. Applicants, therefore, solicits withdrawal of the rejection, and favorable consideration of claims 23, 32 and 40, and new claims 63-67.

Conclusion.

It should, therefore, be apparent that the imposed rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.
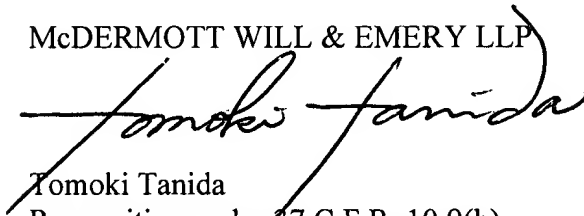
To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

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including extension of time fees, to Deposit Account 500417 and please credit any excess fees to

such deposit account.

Respectfully submitted,

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